

substituents X¹ to X²⁰ in which some of pairs of these substituents may form a cyclic structure. When these substituents are arranged so that a pair of adjacent substituents are aryl groups, at least one of the substituents contain an amine group or an alkenyl group. Accordingly, the claimed compounds have a fluoranthene skeleton structure containing at least one amine group or alkenyl group. The claimed chemical compound is particularly suited for a hole transporting layer or light emitting layer of an organic EL device (see Claims 13 - 15 above).

Nakatsuka et al. discloses an electroluminescence element containing an compound having only a fluoranthene skeleton structure. However, Nakatsuka et al. fail to disclose a fluoranthene skeleton structure comprising any substituted amine group or any substituted alkenyl group. Further, Nakatsuka et al. fails to suggest substituting the fluoranthene structure with an amine group or an alkenyl group. More specifically, Nakatsuka et al. fails altogether of disclose the specific compounds (A-1) to (A-18) and (B-1) to (B-17) (see new Claim 16 above).

Clearly, no *prima facie* case of anticipation can be supported by the disclosure of Nakatsuka et al. because they fail to disclose the all of the embodiments of the claimed electroluminescence device (see Claim 13 above) and/or the claimed compound (see Claim 15 above). Accordingly, withdrawal of this ground of rejection is respectfully requested.

In addition, no *prima facie* case of obviousness can be supported by the disclosure of Nakatsuka et al. because they fail to disclose or suggest the claimed compounds. At best, Nakatsuka et al. discloses an electroluminescence element containing an compound having only a fluoranthene skeleton structure where the compound does not contain any amine group or any alkenyl group. In contrast, the claimed invention relates to a device containing

compounds having a fluoranthene skeleton structure containing at least one amine group or alkenyl group.

The unsubstituted fluoranthene skeleton of Nakatsuka et al. and the amino and alkenyl substituted fluoranthene skeleton-containing compounds of the claimed compounds are not even homologs of each other. The Federal Circuit has defined the parameters that may be considered in determining the proper use of chemical structure as the basis for obviousness rejections under 35 U.S.C. § 103 in In re Jones, 21 USPQ2d 1941 (Fed. Cir. 1992). The court cited the following examples of relationships that have given rise to a *prima facie* case of obviousness:

triorthoesters and tetraorthoesters;
stereoisomers;
adjacent homologs and structural isomers; and
acid and ethyl ester (Id., at 1943).

In the present case, there exists no motivation to modify the compounds disclosed by Nakatsuka et al. to contain either an amine and/or alkenyl group because Nakatsuka et al. is silent in this regard and because the relationship between the claimed compounds and those disclosed by Nakatsuka et al. fail to satisfy any of the above-mentioned relationships to be defined as homologs by the Federal Circuit.

In light of the above, it appears as if the Office is relying on the Applicants disclosure to supply motivation to modify the fluoranthene skeleton-containing compounds disclosed by Nakatsuka et al to contain at least one amine group or alkenyl group in order to arrive at the claimed compounds. However, this is clearly improper according to a recent decision by the U.S. Federal Courts in In re Lee. The Lee Court indicated that the Office must provide

specific motivation, hint, or suggestion, found in the references relied upon to support a *prima facie* case of obviousness. In the present case, the Office appears to rely on the present specification for motivation, which is clearly forbidden according to the Lee Court. In light of this decision, Applicants respectfully request the Office not to use the present specification to find motivation that is not present in any of the disparate disclosures of the references discussed herein.

Even if a *prima facie* case of obviousness is maintained by the Office, the Examiner's attention is directed to inventive example 1 and comparative example 1-3 at pages 63, line 1, to page 66, line 12, of the specification. The inventive example 1 relates to a chemical compound having a fluoranthene skeleton structure substituted with at least one amine group or alkenyl group, while comparative example 3 is 7,14- diphenylacenaphtho[1,2-k]fluoranthene which is exactly the same compound 105 described in Nakatsuka et al. at page 7, line 7 (see also page 12, the fourth line from the last, of the English-language translation).

Applicants further disclose that organic EL devices were constructed containing the above-mentioned inventive example 1 compound and comparative examples 1-3 compounds. The following characteristics of the inventive and comparative organic EL devices were measured: 1) the luminance under application of a direct current of 5.5 volt, 2) the efficiency of light emission, 3) the emitted light color, 4) the half life when the device was driven under a constant current at an initial luminance of 500cd/m². The following table summarizes the results disclosed on the above-mentioned pages for the Examiner's convenience.

TABLE 1: Summarizing the Comparative data between the Inventive Example and the Comparative Examples corresponding to that disclosed in Nakatsuka et al.

Example	Luminance	Efficiency	Color	half-life
Inventive 1	103 cd/m ²	6.2 cd/A	orange	2600 hrs
Comparative 1	105 cd/m ²	7.6 cd/A	yellow	1000 hrs
Comparative 2	35 cd/m ²	3.0 cd/A	yellow-green	300 hrs
Comparative 3	69 cd/m ²	1.3 cd/A	yellow-green	400 hrs

The Examiner is directed to page 2, line 20-24, where one object of the present invention is to provide an compound that may be incorporated into an organic EL device so that the organic EL device exhibits an excellent purity of color, a high efficiency of light emission, a long life, and emits a reddish light. The above table demonstrates that Applicants have discovered such an organic EL device, and that such properties are achieved due to the presence of the novel claimed compounds in the device.

The claimed EL device that contain compounds having a fluoranthene skeleton structure substituted with at least one amine group or alkenyl group is patentably distinct from the applied art because such compounds are able to provide organic EL devices with superior qualities when compared to those of the comparative organic EL devices which contain compounds having fluoranthene skeleton structure without an amine group or alkenyl group. For example, Example 1 embodied by the present invention has about 1.5 times greater luminance, 5 times greater efficiency, and 6.5 times greater half-life than that of Comparative Example 3 (which is compound 105 described in .

The rejections of Claims 11-12 under 35 U.S.C. § 112, first paragraph, are obviated by the above amendment. More specifically, Claims 2 and 10 have been canceled in favor of

new Claims 13 and 15, respectively. Further, all dependent claims have been amended to depend from new Claim 13. Claims 13 and 14 have been amended to clarify the rejected phrase indicated by the Office to be “indefinite” and replace the same with the phrase “with the exception that the combination of forming any cyclic structure with any of the substituted group pairs X^{13} and X^{14} , X^3 and X^4 , X^{10} and X^{11} , and X^6 and X^7 in the general formula (3) is omitted;”. Accordingly, withdrawal of these grounds of rejection is respectfully requested.

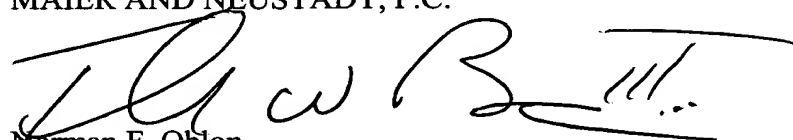
The rejections of Claims 11-12 under 35 U.S.C. § 112, first paragraph, are obviated by the above amendment. More specifically, Applicants have amended the claims to specify that the “organic layer comprises at least one member of the group consisting of a hole transporting layer and a light emitting layer.” Further, Claim 12 is amended to depend from Claim 6 and remove the phrase “, and which emits reddish light.” Accordingly, withdrawal of these grounds of rejection is respectfully requested.

The objection of Claim 9 for depending from a rejected claim is obviated by the cancellation of this claim in favor of new Claim 14. Please note that Applicants have rewritten Claim 9 in favor of new Claim 14 so that Claim 14 is drawn to the embodiments of Claim 9 and is independent. Accordingly, withdrawal of this ground of objection is respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Early notice to this effect is respectfully requested. Should anything further be required to place this application in condition for allowance, the Examiner is requested to contact the undersigned by telephone.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER AND NEUSTADT, P.C.



Norman F. Oblon
Registration No. 24,618
Attorney of Record

Thomas W. Barnes III, Ph.D.
Registration No. 52,595



22850

(703) 413-3000

(703) 413-2220

I:\atty\Twb\197893us-am-b.wpd

Marked-Up Copy

Serial No: 09/675,201

Amendment Filed on:

Herewith

IN THE SPECIFICATION

Please delete the paragraph beginning at page 65, line 20, and replace the same with the following:

--An organic EL device was obtained in accordance with the same procedures as those conducted in Example 1 except that 7,14- diphenylacenaphtho[1,2-k]fluoranthene described in Japanes Patent Application Laid-Open No. Heisei [11(1999)-168445] 10(1998)-168445 as vapor deposited on place of Compound A-1 so that a film containing 2% by mole of this fluoroanthene was formed.--

IN THE CLAIMS

Please amend the claims as follows.

--3. (Twice Amended) The organic electroluminescence device according to Claim [2] 13, wherein the organic layer is at least one of a hole transporting layer and a light emitting layer.

4. (Twice Amended) The organic electroluminescence device according to Claim [2] 13, wherein the organic layer comprises 1 to 70% by weight of said compound which is selected from compounds represented by general formulae [1] to [14] and [16] to [18]:.

5. (Twice Amended) The organic electroluminescence device according to Claim [2] 13, wherein a layer of an inorganic compound is disposed between the organic layer and the electrode.

6. (Twice Amended) The organic electroluminescence device according to Claim [2] 13, which emits reddish light.

7. (Twice Amended) The organic electroluminescence device according to Claim [2] 13, wherein the organic layer comprises said compound and isomers thereof.

11. (Amended) The organic electroluminescence device according to Claim [2] 13, wherein the organic layer [is] comprises at least one member of the group consisting of a hole transporting layer and a light emitting layer, and wherein a layer of an inorganic compound is between the organic layer and the electrode.

12. (Amended) The organic electroluminescence device according to Claim [2] 6, wherein the organic layer comprises at least one member of the group consisting of a hole transporting layer and a light emitting layer[, and which emits reddish light].--

--Claims 2, 9, and 10 is cancelled.--

--Claims 13-17 are added.--